



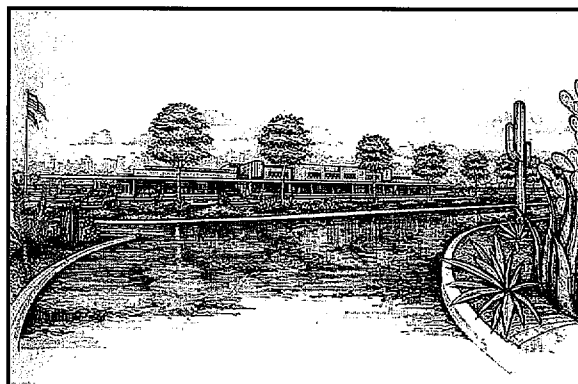
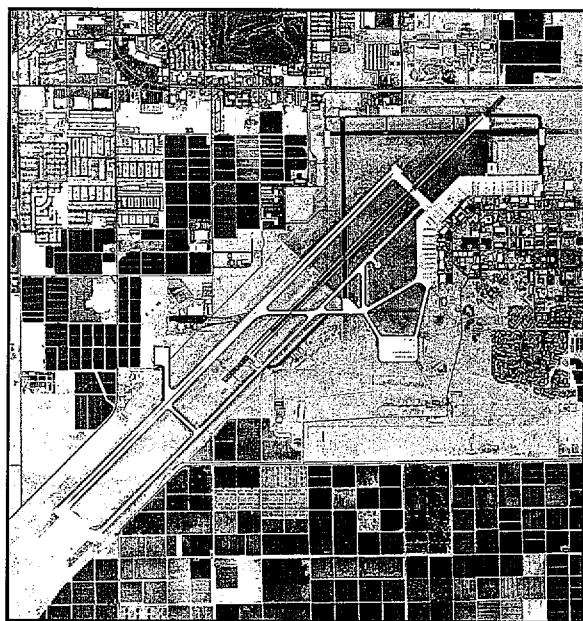
Chapter One INVENTORY

INVENTORY

The inventory of existing conditions at Yuma International Airport will serve as an overview of the airport, its facilities, its role in regional and national aviation systems, and the relationship to development that has occurred around the airport over the years. The information outlined in this chapter provides a foundation, or starting point for all subsequent evaluations.

Developing the master plan for Yuma International Airport requires collecting and evaluating information relating to the airport and surrounding area. This information includes:

- Physical inventories and descriptions of facilities and services currently provided at the airport.



- Background information relating to the Yuma area and descriptions of development that has taken place in the airport environs recently.
- Population and socioeconomic information that provides an indication of the market and possible future development in the Yuma County area.

An accurate and complete inventory is essential to the success of the master plan since the findings, conclusions, and recommendations made in the plan are dependent upon collected information. This information was obtained through on-site investigations of the airport and interviews with Yuma County Airport Authority (YCAA) staff, Yuma Marine Corps Air Station (MCAS), airport tenants, representatives of various City and County offices, and regional economic development agencies. Additional information was obtained from available documents and studies

concerning the City of Yuma and the Yuma County area.

REGIONAL SETTING

Yuma International Airport is located in the southeast corner of the City of Yuma, approximately two and one half miles from the city's central business district. Located in the far southwest corner of the State of Arizona, the City of Yuma is located fifteen miles north of Mexico and four miles east of the Arizona-California border (which follows the Colorado River) and serves as the County seat for Yuma County. The Gila River and Colorado River converge north of the City.

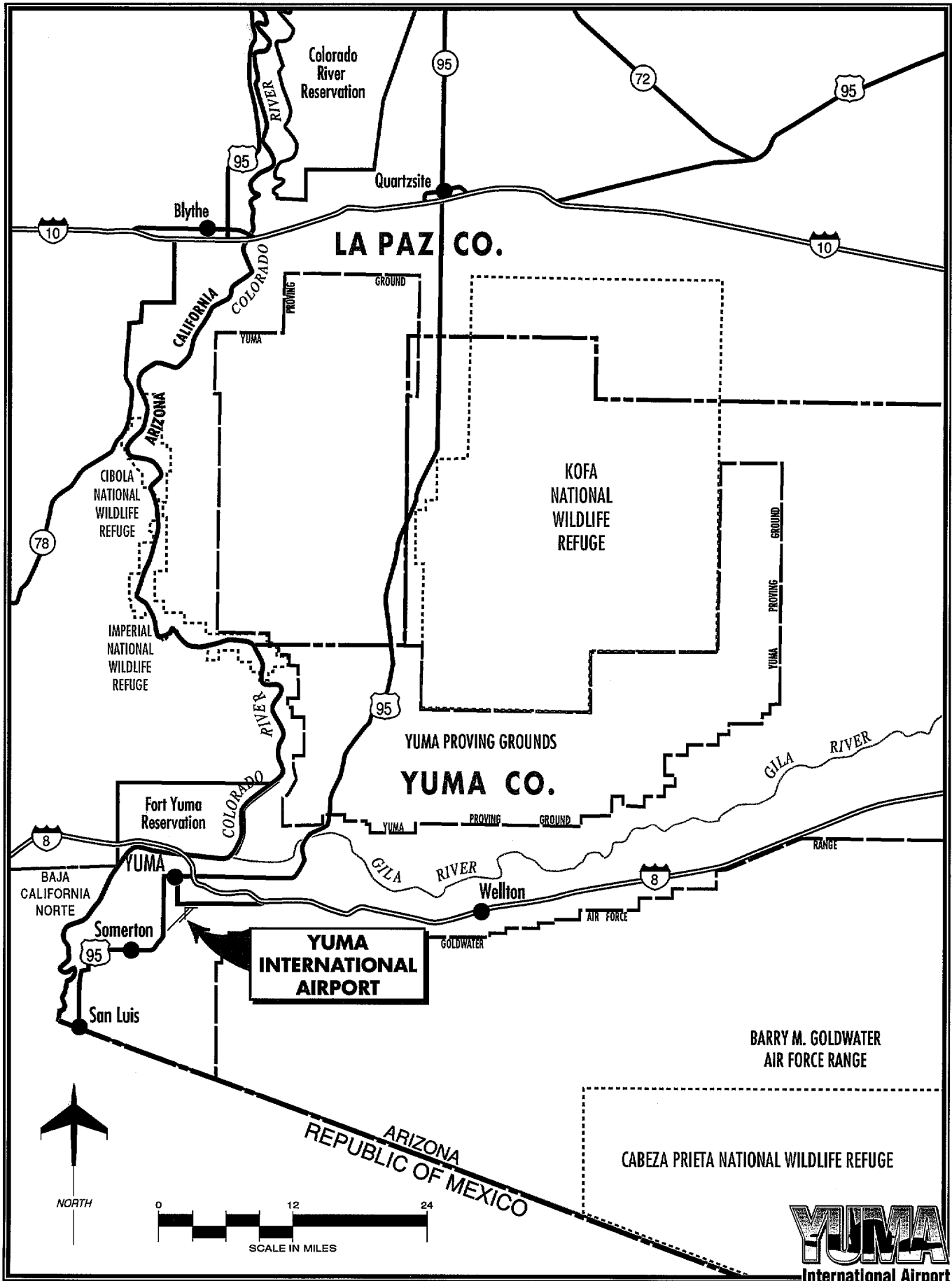
Agriculture plays a dominant role in the regional economy. Climatic conditions permit year-round farming on irrigated land. Agricultural production in the Imperial and Yuma Valleys in the United States and the Mexicali-San Luis Valley in Mexico center around citrus, produce, cotton, and wheat. Ranching is another important aspect of the area's economy, producing more than 100,000 head of pen-fed cattle annually. The Yuma MCAS and Yuma Proving Grounds contribute substantially to the local economy. Tourist business, comprised mainly of cross-country travelers and winter visitors, add an additional \$350 million annually to the local economy. The Mexican free-port of San Luis Colorado lies 23 miles southwest of Yuma, and offers facilities necessary for modern manufacturing operations.

Exhibit 1A illustrates Yuma International Airport and its relationship to the surrounding region. Interstate Highway 8 and U.S. Highway 95 converge in Yuma. Interstate Highway 8 is a major east-west route linking Yuma to central Arizona (to the east) and southern California (to the west). U.S. Highway 95 is a north-south route linking Yuma to Las Vegas (to the north) and Mexico (to the south). The airport is located adjacent to 32nd Street (Business Route 8), the main route through the city.

The passenger terminal building is accessed via 32nd Street. General aviation facilities located west of Runway 3L-21R are accessed via Fortuna Avenue, Arizona Avenue, 36th Street, and Burch Way. The air cargo apron is accessed via 4th Avenue to 40th Street.

THE AIRPORT'S SYSTEM ROLE

Airport planning exists on several levels: local, state, and national. Each level has a different emphasis and purpose. This master plan is the primary local airport planning document. At the state level, the airport is included in the *Arizona State Aviation System Plan (SASP)*. The purpose of the *SASP* is to ensure that the State has an adequate and efficient system of airports to serve its aviation needs well into the 21st century. The *SASP* defines the specific role of each airport in the State's



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aviation system and establishes funding needs. Through the State's Continuous Aviation System Planning Process (CASPP), the *SASP* is updated every five years. The most recent update to the *SASP* is the 1995 *Arizona State Aviation Needs Study* (*SANS*). The purpose of the *SANS* is to provide policy guidelines that promote and maintain a safe aviation system in the State, assess the State's airports capital improvement needs, and identify resources and strategies to implement the plan. The 1995 *SANS* included all public and private airports and heliports in Arizona which are open to the public, including American Indian and recreational airports.

At the national level, the airport is included in the *National Plan of Integrated Airport Systems* (*NPIAS*). The *NPIAS* includes a total of 3,660 airports (both existing and proposed) which are important to national air transportation. The *NPIAS*, which classifies Yuma International Airport as a Joint-Use, Primary Commercial Service Airport, includes estimates on the total development needs of the nation's airports which are eligible for federal funding assistance.

AIRPORT HISTORY

The existing airport site was originally known as Fly Field and opened in 1928. It was named for Col. Benjamin Franklin Fly. He negotiated (on behalf of Yuma County) the original lease for the majority of the present site with the U.S. Department of Interior.

In 1942, shortly after World War II began, the War Department took control of the facility. Known as Yuma Army Air Base during the war, it served as a training facility for many combat aviators. The field was deactivated at the end of the war and its control reverted to Yuma County.

During the Korean War, the Air Force reactivated the airport as a military airfield, and it later became known as Vincent Air Force Base. In 1956, the land was divided into two areas. A joint-use patent was deeded to Yuma County for the area that is currently the civil portion of Yuma International Airport. The balance, including all runways and taxiways, remained under military control. January 1, 1959 marked the stand up of Marine Corps Auxiliary Air Station, Yuma (MCAAS). It remained MCAAS until July 30, 1962 when the designation was changed to Marine Corps Air Station, Yuma (MCAS). The 1956 joint-use patent provides for the joint-use of the airport. Specifically, the patent provides for unrestricted civil aviation use of the airport. The patent preserved the ability for Yuma County to collect and retain landing fees to provide for operating expenses.

The Yuma County Airport Authority (YCAA) was established in 1964 to administer civil activities at Yuma International Airport. The existing airport site encompasses approximately 3,100 acres. The YCAA controls and operates the approximately 300 acres of land owned by both Yuma County and the YCAA for civilian activities at the airport. Additionally, aviation easements totaling approximately 11

acres protect the Runway 8 and Runway 17 runway protection zones.

AIRPORT MANAGEMENT

The management of civilian operations at the airport is the responsibility of the Yuma County Airport Authority. Airport Authority responsibilities include the planning, development, administration, and maintenance of the commercial and general aviation facilities available at Yuma International Airport. An Airport Authority staff of twenty-one employees carries out administration, operations, security, and maintenance duties of all facilities owned and controlled by the YCAA.

AIR TRAFFIC ACTIVITY

The recording of air traffic activities is an important function in the operation of an airport. Historical accounting of

aircraft operations, airline passengers, and freight data provide a means of forecasting future activity trends. Air traffic statistics at Yuma International Airport are collected by the YCAA from information supplied by the airlines, Marine Corp Air Station (MCAS), and airport tenants.

AIRCRAFT OPERATIONS

The MCAS airport traffic control tower (ATCT), collects and reports aircraft operations (aircraft takeoffs and landings) during the hours from 7:00 a.m. to midnight daily. The MCAS records aircraft operations in three general categories: air carrier/air taxi, general aviation, and military. A summary of this data covering the period 1992 to 1996 is presented in **Table 1A**, while **Exhibit 1B** illustrates an annual operation summary by category. Between 1992 and 1996, annual operations declined, falling from 155,607 in 1992 to 120,270 in 1996.

TABLE 1A
Aircraft Operations Summary (1992-1998)

Year	Air Carrier/ Air Taxi	General Aviation	Military	Total
1992	14,373	36,171	105,063	155,607
1993	15,795	36,281	97,197	149,273
1994	18,507	35,804	95,174	149,485
1995	19,842	27,091	86,971	133,904
1996	18,925	25,485	75,860	120,270

Source: MCAS Yuma

COMMERCIAL AIR SERVICE

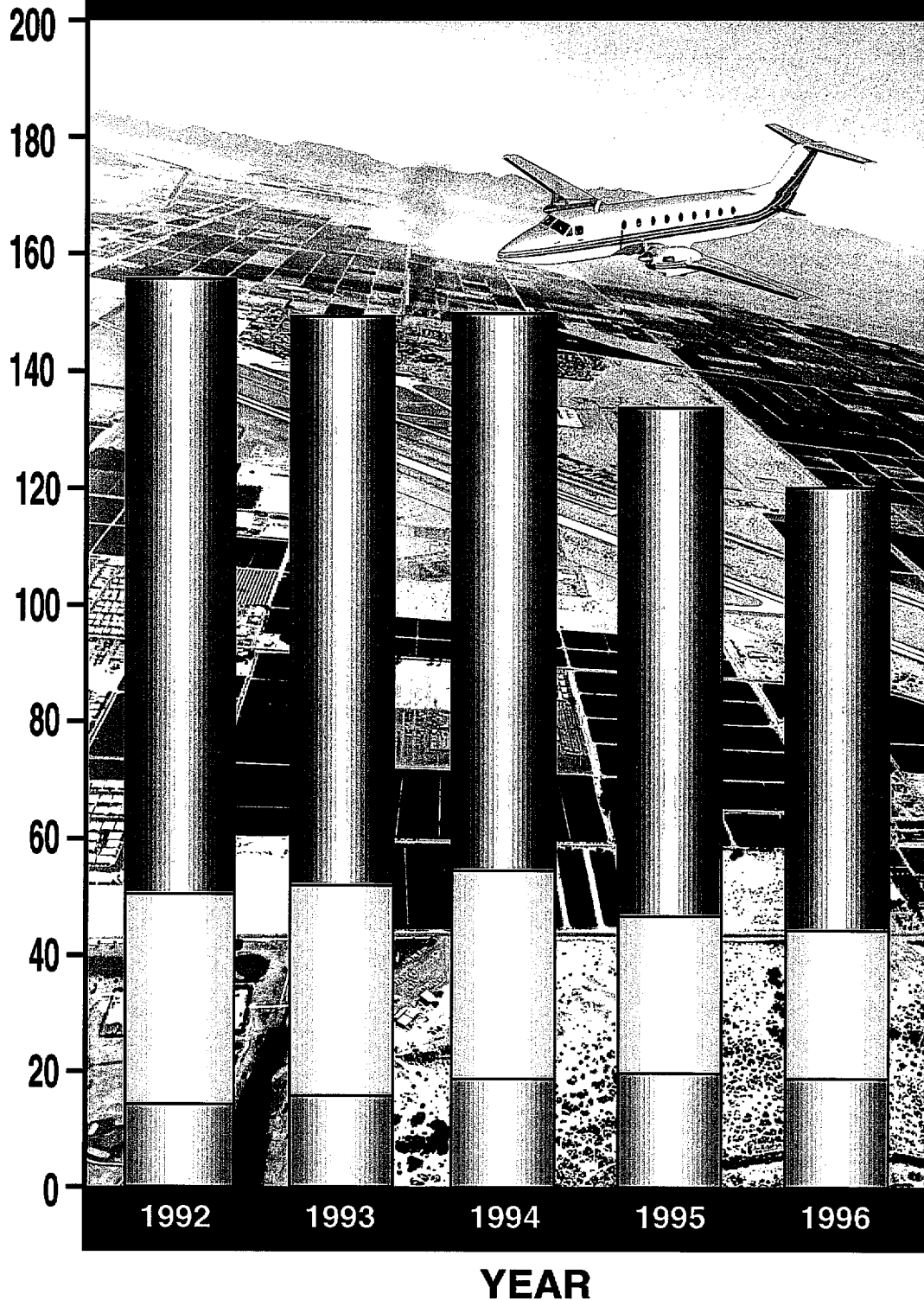
Data concerning airline passenger enplanements at Yuma International

Airport is collected and recorded by airport management from data provided by the air carriers operating at the airport. **Table 1B** summarizes historical

OPERATIONS (in thousands)

ANNUAL OPERATIONS SUMMARY

1992-1996



LEGEND:

Air Carrier/Air Taxi
 General Aviation
 Military

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annual enplanements for the airport between 1992 and 1996 by month and annual total. Air carrier enplanements have increased annually between 1992 and 1996, growing at an average annual rate of 3.4 percent. Historically, the

peak month for passenger enplanements has been December and represented 10 percent of total enplanements. The peak month for passenger enplanements in 1996 was February and was 11 percent of total 1996 enplanements.

TABLE 1B
Historical Enplanements (1992-1998)

Month	1992	1993	1994	1995	1996
January	5,807	5,618	5,449	5,868	7,229
February	5,630	6,109	6,241	6,300	8,123
March	6,417	5,292	6,640	7,641	7,781
April	5,225	5,792	5,719	5,765	6,538
May	4,714	5,100	4,885	5,796	5,927
June	4,840	4,545	5,169	5,735	5,340
July	4,701	4,386	4,467	4,644	4,672
August	4,259	4,296	4,360	4,704	4,840
September	4,179	4,670	4,749	5,099	4,597
October	4,669	5,521	5,126	5,775	5,260
November	5,274	5,497	5,878	5,900	5,972
December	6,542	6,597	6,942	7,743	7,312
Total	62,257	64,423	65,625	70,970	73,591

Airline activity at Yuma International Airport in 1997 consisted exclusively of commuter airline activity, providing service to Phoenix and Los Angeles. In July 1997, there were three air carriers serving Yuma: Delta Connection (Skywest), America West Express (Mountain West Airlines) and United Express (Westair). United Express provided direct service to Los Angeles using Jetstream J31 aircraft. Delta Connection also provided direct service to Los Angeles using Embraer 120 Brasilia aircraft. America West Express provided direct service to Phoenix using Beechcraft 1900 aircraft. Based upon a June 1997 airline schedule, there were a total of 23 departures each weekday, with 13 to Phoenix and 10 to Los

Angeles. Saturday service was reduced to 16 departures: 9 to Los Angeles and 7 to Phoenix. In July 1997, Skywest (Delta Connection) announced plans to discontinue service to Yuma effective October 1, 1997. (As of final printing, United Express [Skywest] provided six daily roundtrip flights to Los Angeles while America West Express provided six daily roundtrip flights to Phoenix.)

AIR CARGO

Air cargo is an encompassing term that includes air mail, air freight, and air express. Air cargo services at the airport are provided by the passenger air carriers, as well as dedicated all-

cargo airlines. The all-cargo airlines presently serving Yuma are United Parcel Service (UPS), FedEx, and Airborne Express. FedEx uses Cessna Caravan aircraft for its operations while UPS and Airborne service is provided utilizing Piper Navajo aircraft. These aircraft provide feeder services to Phoenix, where cargo is transferred to all-cargo jet aircraft. According to YCAA records, enplaned mail totaled 4.8 tons and enplaned freight totaled 290 tons in 1996. Deplaned freight totaled 495 tons in 1996.

AIRPORT FACILITIES

Airport facilities can be functionally classified into two broad categories: airside and landside. The airside category includes those facilities directly associated with aircraft operations. The landside category includes the facilities necessary to provide the transition from surface to air transportation and support facilities necessary for the safe operation of the airport.

AIRFIELD FACILITIES

Airside facilities include runways, taxiways, and airport lighting. A depiction of the airside facilities at the airport is provided on **Exhibit 1C**.

Runways

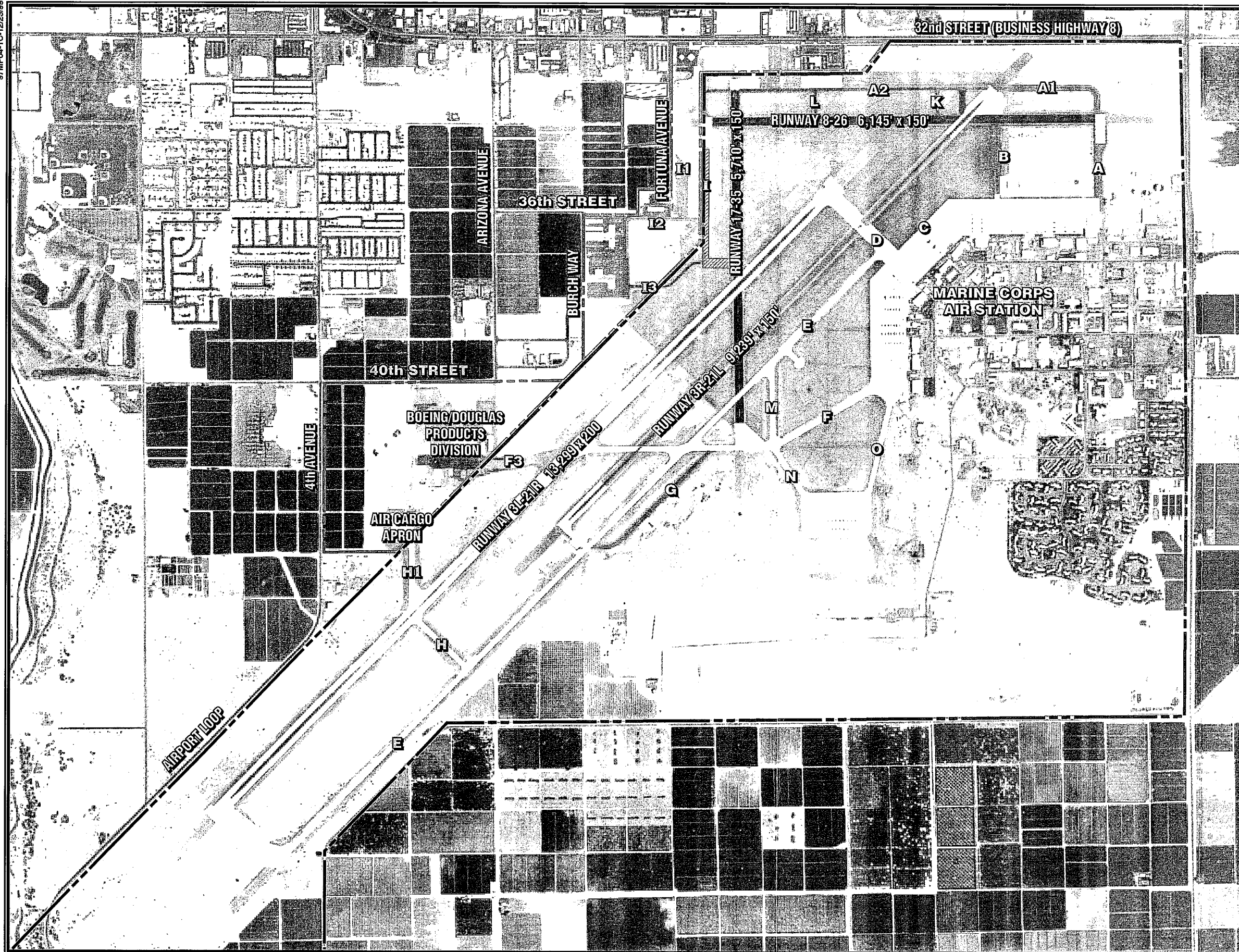
There are four runways available for use at Yuma International Airport. Runways 3L-21R and 3R-21L lie parallel to one another and are used

primarily by military aircraft operating from MCAS Yuma. Runways 17-35 and 8-26 serve primarily civilian operations.

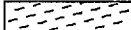

Runway 3L-21R is 13,299 feet long, 200 feet wide, and oriented in a northeast-southwest direction. Runway 3L-21R is constructed of concrete and has a pavement strength rating of 103,000 pounds single wheel loading (SWL), 200,000 pounds dual wheel loading (DWL), and 400,000 pounds dual-tandem wheel loading (DTWL). Single wheel loading refers to the design of the aircraft landing gear which has a single wheel on each main landing gear strut. Dual wheel loading refers to the design of certain aircraft landing gear which has two wheels on each main landing gear strut. Dual tandem wheel loading refers to main landing gear struts with a tandem set of dual wheels. A 1,000-foot paved overrun is available at the Runway 3L end. A 660-foot paved overrun is located at the Runway 21R end. Runway 3L-21R is the longest runway available for civilian use in Arizona.

Runway 3R-21L is located 700 feet east of, and parallel to Runway 3L-21R. This runway is 9,239 feet long by 150 feet wide. A 1,000-foot paved overrun is located at the northeast end, while a 900-foot paved overrun is located at the southwest end. Runway 3R-21L is constructed of asphaltic-concrete and has a wheel loading capacity of 162,000 pounds SWL, 200,000 pounds DWL, and 400,000 pounds DTWL.

Runway 8-26 is 6,145 feet long, 150 feet wide, and oriented in an east-west direction. The runway is constructed of



LEGEND

- YCAA Property Line
-  Avigation Easements
- MCAS-Yuma Property Line
-  Taxiway India Easement



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asphaltic-concrete and has a pavement strength rating of 63,000 pounds SWL, 137,000 pounds DWL, and 206,000 pounds DTWL. A 900-foot paved overrun is located at the east end of the runway, while a 200-foot paved overrun is located at the west end.

Runway 17-35 is 5,710 feet long, 150 feet wide, and oriented in a north-south

direction. Runway 17-35 is constructed of asphaltic-concrete and has a pavement strength rating of 72,000 pounds SWL, 171,000 pounds DWL, and 255,000 DTWL. It has paved overruns of 250 feet at the north end and 900 feet on the south end.

Table 1C presents a summary of runway information for the airport.

TABLE 1C Runway Data				
	Runway 3L-21R	Runway 3R-21L	Runway 8-26	Runway 17-35
Length (feet)	13,299	9,239	6,145	5,710
Width (feet)	200	150	150	150
Surface Material	Concrete	Asphaltic- Concrete	Asphaltic- Concrete	Asphaltic- Concrete
Pavement Strength (lbs)				
SWL	103,000	162,000	63,000	72,000
DWL	200,000	200,000	137,000	171,000
DTWL	400,000	400,000	206,000	255,000
Edge Lighting	HIRL	HIRL	HIRL	HIRL
Approach Lighting	MALSR (21) PAPI (3L)(21R)	None PAPI (3R)(21L)	None	VASI (17), REIL (35)
Markings	Precision	Nonprecision	Basic	Nonprecision
Instrument Approach Procedures	ILS (21R) RNAV or GPS (21R)	None	None	VOR/DME or GPS (17) VOR (17)
Traffic Pattern	3L - Right 21R - Left	3R - Right 21L - Left	8 - Right 26 - Left	17 - Right 35 - Left

Taxiways

The taxiway system at the airport includes full-length parallel taxiways, runway exit/entrance taxiways, and stub taxiways providing access to landside facilities. **Exhibit 1C** identifies the taxiway system at Yuma International Airport.

Taxiways A1 and A2, combined, provide parallel taxiway access for Runway 8-26. Located along the north side of the runway, Taxiway A1 extends between the Runway 3R-21L threshold and the Runway 26 end while Taxiway A2 extends from the Runway 3R-21L threshold to the Runway 8 end and intersects with Taxiway I. Taxiways K

and L are exit taxiways located along Runway 8-26. Taxiways A and B are located south of Runway 8-26 and provide access to the MCAS apron areas. Taxiways A1, A2, K, and L are 50 feet wide. Taxiways A and B are 75 feet wide.

Taxiway I is a partial parallel taxiway located west of Runway 17-35 which provides access to the existing general aviation facilities. Taxiway I1 provides access to general aviation facilities located west of Taxiway I. Taxiway segments I2 and I3, also known as the "Loop Taxiway", extend west from Taxiway I along the south end of the MCAS transceiver site to the west general aviation parking apron, then east back to Taxiway I. Taxiways I, I1, I2, and I3 are 40 feet wide. Taxiway I is maintained by the YCAA. Additionally, the YCAA has an easement for the portion of Taxiway I which is located on MCAS property.

Runways 3L-21R and 3R-21L, the air cargo apron, and the Boeing/Douglas Products Division lease site are served by Taxiways D, E, F and H. Taxiway D provides access to the Runway 21R threshold from the MCAS apron area and is 150 feet wide. Taxiway E extends the full length of Runway 3L-21R and is located 500 feet east of Runway 3R-21L. Taxiway F extends between the MCAS apron area and provides access to the Runway 35 end and Runway 3L-21R. The Boeing/Douglas Products Division lease site is served by Taxiway F3. Taxiway H extends between Taxiway E and the air cargo apron. Taxiways E, F, and H are 75 feet wide. The YCAA has easements for Taxiways F3 and H1 which are located on MCAS property.

Taxiway M lies parallel to Runway 17-3 and is located between Taxiways E and F. Taxiway M was constructed in 1985 and is 75 feet wide. Taxiways N and O, also constructed in 1985, lead to the ordinance loading area. Taxiway N extends from the intersection of Taxiways M and F. Taxiway O extends between the ordinance area and the MCAS apron. Taxiways N and O are 75 feet wide. Taxiway G is located approximately 300 feet east of Taxiway E and serves as a by-pass taxiway for Taxiway E and provides access to MCAS aircraft run-up facilities. Taxiway G is 75 feet wide. Taxiway C is 150 feet wide and extends around the outer perimeter of the main MCAS apron.

Airfield Lighting

Airfield lighting is an essential component of any airfield system. Lighting aids provide airport identification, delineate airside facilities, and provide approach assistance during nighttime and poor visibility conditions. Yuma International Airport is currently equipped with a variety of lighting aids.

Identification Lighting: The location and presence of the airport at night is indicated by the airport beacon. The airport beacon at Yuma International Airport is located atop a 100-foot tower on the southeast side of the airport at the approximate center of MCAS. This rotating beacon is equipped with an optical system that projects two beams of light, one green and one white, 180 degrees apart.

Runway and Taxiway Lighting:

Runway and taxiway lighting utilizes lighting fixtures placed near the pavement edge to define the lateral limits of the pavement. This lighting is essential for maintaining safe operations at night and/or during times of poor visibility in order to maintain safe and efficient access from the runway and aircraft parking areas. Each runway is equipped with High Intensity Runway Lighting (HIRL). Runway threshold lighting identifies each runway end. Each taxiway at the airport is equipped with Medium Intensity Taxiway Lighting (MITL). The lighting systems for Runways 8-26 and 17-35, and Taxiways A, A1, A2, B, C, L, and I can be activated by utilizing the radio transmitter in the aircraft during times when the tower is closed. The lighting systems for Runways 3L-21R and 3R-21L can be activated by approach control when the tower is closed.

Visual Approach Lighting: A visual approach slope indicator (VASI) is installed at the Runway 17 end. The VASI consists of a system of lights located near the runway threshold. When interpreted by the pilot they give him or her an indication of being above, below, or on the designed descent path to the runway. The Runway 17 VASI is currently out of service due to trees which are obstructing the approach path to Runway 17. The YCAA has a state grant to remove the obstructions and is currently negotiating with property owners to trim or remove the trees and obtain easements to prevent growth into the approach path in the future. Precision approach path indicators (PAPIs) are installed at each end of Runway 3L-21R and Runway 3R-21L.

Runway End Identification

Lighting: Runway end identifier lights (REIL's) provide rapid and positive identification of the approach end of a runway. The REIL system consists of two synchronized flashing lights, located laterally on each side of the runway threshold facing the approaching aircraft. A REIL is installed at the Runway 35 end.

Approach Lighting: A medium intensity approach lighting system with runway alignment indicator lights (MALSR) is installed at the Runway 21R threshold. A MALSR consists of a configuration of light signals extending into the approach area from the runway threshold to aid pilots transitioning from instrument flight to visual flight and landing.

An optical landing system and precision approach radar are available for both military and civilian use at the airport.

Pavement Markings

Pavement markings aid in the movement of aircraft along airport surfaces. The precision markings along Runway 3L-21R identify the runway centerline, designation, touchdown, threshold, and pavement edge. The nonprecision markings along Runways 17-35 and 3R-21L identify the runway centerline, designation, threshold, and touchdown location. The basic markings to Runway 8-26 identify the runway centerline and designation. The taxiways and taxilanes at the airport are equipped with centerline markings. Pavement markings also identify aircraft parking positions and holdlines.

Navigational Aids

Navigational aids are electronic devices that transmit radio frequencies which properly equipped aircraft and pilots translate into point-to-point guidance and position information. Navigational aids, located on or near the airport, can be functionally classified as either enroute or terminal area navigational aids.

Enroute Navigational Aids: These electronic devices are used by pilots when flying from one airport to another. The types of electronic navigational aids available for aircraft enroute to the airport include the Very High Frequency Omnidirectional Range (VOR) facility, nondirectional beacon (NDB), Loran-C, RNAV, and Global Positioning System (GPS).

The VOR, in general, provides azimuth readings to pilots of properly equipped aircraft by transmitting a radio signal at every degree to provide 360 individual navigational courses. Frequently, distance measuring equipment (DME) is combined with a VOR facility to provide distance as well as direction information to the pilot. Military tactical air navigation aids (TACAN's) and civil VOR's are commonly combined to form a VORTAC. A VORTAC provides distance and direction information to civil and military pilots. The Bard VORTAC, located approximately seven nautical miles northwest of the airport, can be utilized by pilots flying to or from the airport.

The NDB transmits nondirectional radio signals whereby the pilot of properly equipped aircraft can determine the

bearing to or from the NDB facility and then "home" or track to or from the station. Pilots flying to or from the airport can utilize the Golden Eagle NDB located approximately 15 nautical miles northeast of the airport.

Loran-C is a ground-based enroute navigational aid which utilizes a system of transmitters located in various locations across the continental United States. Loran-C varies from the VOR and NDB as pilots are not required to navigate using a specific facility (with the VOR and NDB pilots must navigate to and from a specific VOR or NDB facility). With a properly equipped aircraft pilots can navigate to any airport in the United States.

RNAV is a method of navigation which permits aircraft operation on any desired flight path using VOR transmitters. Special equipment installed in the aircraft permits direct flights and eliminates the need to fly directly to or from the VORTAC site.

GPS is an additional navigational aid for pilots enroute to the airport. GPS was initially developed by the United States Department of Defense for military navigation around the world. Increasingly, over the last few years, GPS has been utilized more in civilian aircraft. GPS uses satellites placed in orbit around the globe to transmit electronic signals which properly equipped aircraft use to determine altitude, speed, and navigational information. GPS is similar to Loran-C as pilots can directly navigate to any airport in the country and are not required to navigate using a specific navigational facility.

The FAA is proceeding with a program to gradually replace all traditional enroute navigational aids with GPS over the next decade. The FAA phase-out schedule for traditional navigational aids includes VOR's between 2005 and 2010, NDB's between 2000 and 2005, and Loran-C by the year 2000.

Terminal Area Navigational Aids: In addition to providing course guidance information for aircraft in the enroute phase of their flight, the previously mentioned VOR and GPS navigational aids can be used by pilots when locating and landing at the airport. An Instrument Landing System (ILS), installed on Runway 21R, also aids pilots in locating and landing at the airport. The ILS is an approach landing aid designed to identify the exact approach path and descent to landing for properly equipped aircraft. The GPS and VOR navigational aids do not provide descent information.

Instrument Approach Procedures

Instrument approach procedures are a series of predetermined maneuvers established by the FAA using electronic navigational aids that assist pilots in locating an airport during low visibility and cloud ceiling conditions. There are four published instrument approach procedures to the airport using the previously mentioned ILS, GPS, and VOR navigational facilities. The ILS approach to Runway 21R enables aircraft to locate and land at the airport when cloud ceilings are as low as 200 feet above the ground and the visibility is reduced to one-half mile. A VOR/DME or GPS approach to Runway 17 allows

for approaches to landings when cloud ceilings are as low as 400 feet above the ground and visibility is restricted to one mile. A VOR approach to Runway 17 enables aircraft to land at the airport when cloud ceilings are as low as 400 feet above the ground and visibility is reduced to one mile. A RNAV or GPS approach to Runway 21R provides for landings with 500-foot cloud ceilings and one-half mile visibility.

LANDSIDE FACILITIES

Landside facilities include passenger terminal facilities, aircraft storage facilities, aircraft parking aprons, and support facilities such as fuel storage. Within the discussion of landside facilities is a description of existing general aviation services and airport tenants. Landside facilities at the airport are identified on **Exhibit 1D**.

Passenger Terminal Facilities

The original passenger terminal building at Yuma International Airport is located north of Runway 8-26 along 32nd Street as identified on **Exhibit 1D**. Originally constructed in 1968 and expanded in 1980 and 1986, the existing terminal building is a rectangular, metal-framed structure with stucco exterior and encompasses approximately 14,000 square feet.

The original terminal building was closed and replaced by a new passenger terminal building adjacent to the existing site. The new terminal building provides five air carrier gate positions, expanded ticketing, bag claim, and

departure areas, as well as a mechanized baggage claim system, and an upgraded security system. Upgraded passenger amenities include an ATM, postal center, passenger business center providing fax service, telephones, computer access, and a conference room, and flight monitors. Concurrent with the construction of the new passenger terminal building was parking, access, and curb improvements. YCAA administrative offices were relocated to the second floor of the passenger terminal building.

Floor plans of the first and second floors of the new terminal complex are illustrated on **Exhibit 1E**. **Table 1D** summarizes the new passenger terminal building space by functional category.

The terminal apron encompasses approximately 17,200 square yards along the south side of the existing terminal building. Partially reconstructed in 1991, the concrete apron will be expanded eastward to accommodate additional parking positions with the development of the new terminal building. The aircraft parking apron is located on MCAS property. Additionally, the new terminal penetrates the transitional surface for Runway 8-26. The military has granted a waiver for the terminal penetration while an easement has been given to YCAA for aircraft operations along the terminal apron.

Air Cargo Facilities

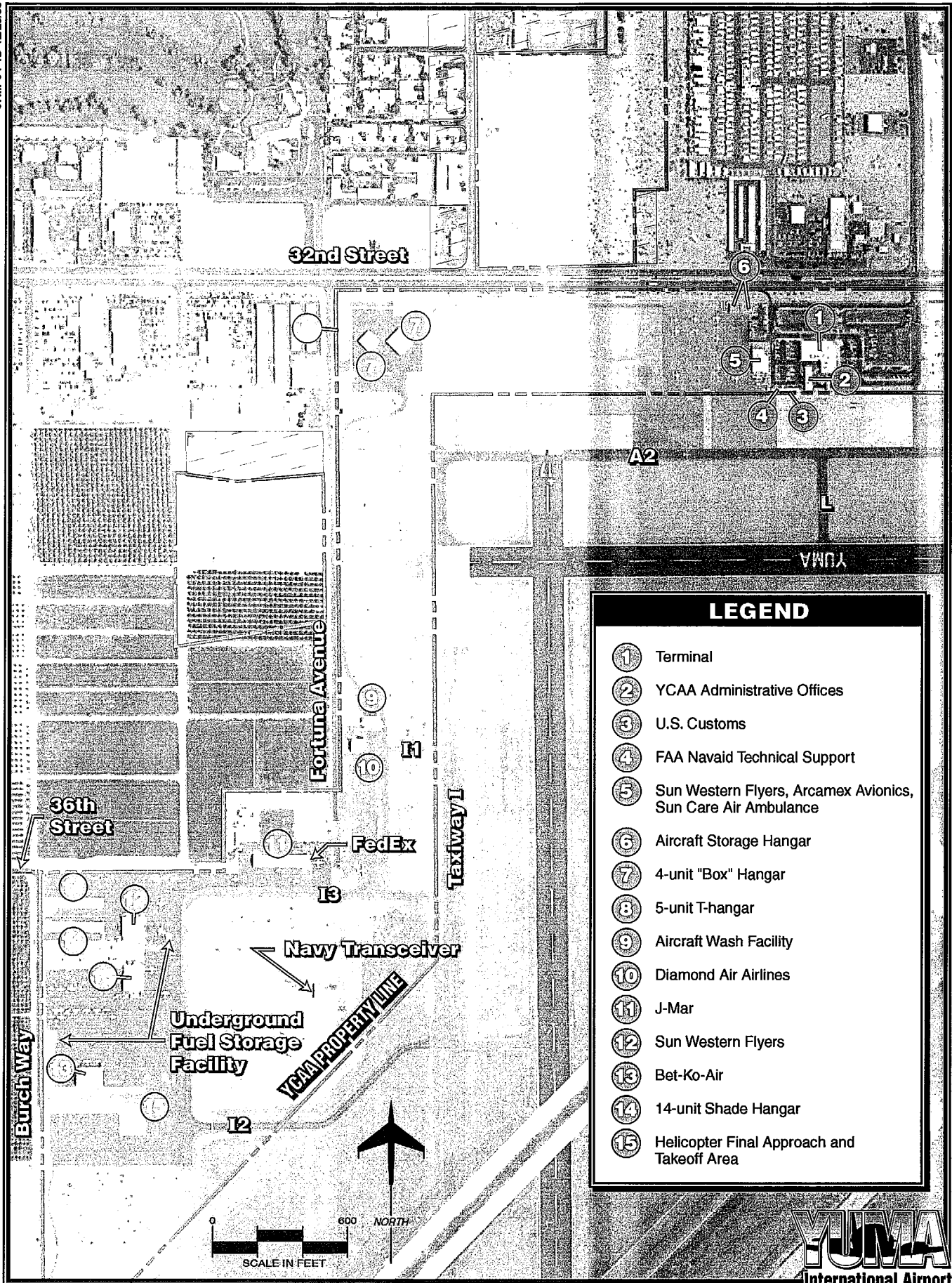
Presently, there is no single building or facility dedicated solely to air cargo on

the airport. FedEx is located within the J-Mar Hangar facility along Taxiway I2. Airborne Express and UPS facilities are located off airport. Currently, these operators transfer freight directly from the aircraft to vehicles on the apron.

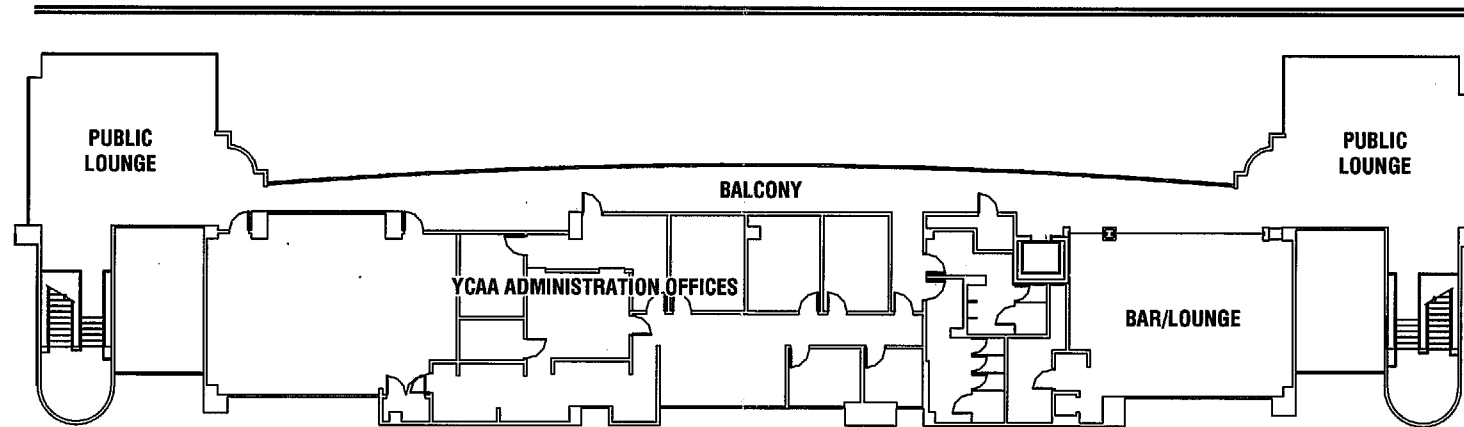
A cargo apron and connecting taxiway was constructed in 1995 to accommodate large cargo aircraft and are identified on **Exhibit 1C**. Located west of Runway 3L-21R, the cargo apron is constructed of concrete and encompasses approximately 17,800 square yards. This master plan will examine options for future air cargo facility development along this apron and expansion possibilities for the full 80 acres currently designated for long term air cargo development. The cargo apron is accessed via 4th Avenue/Airport Loop road from 32nd Street.

General Aviation Facilities

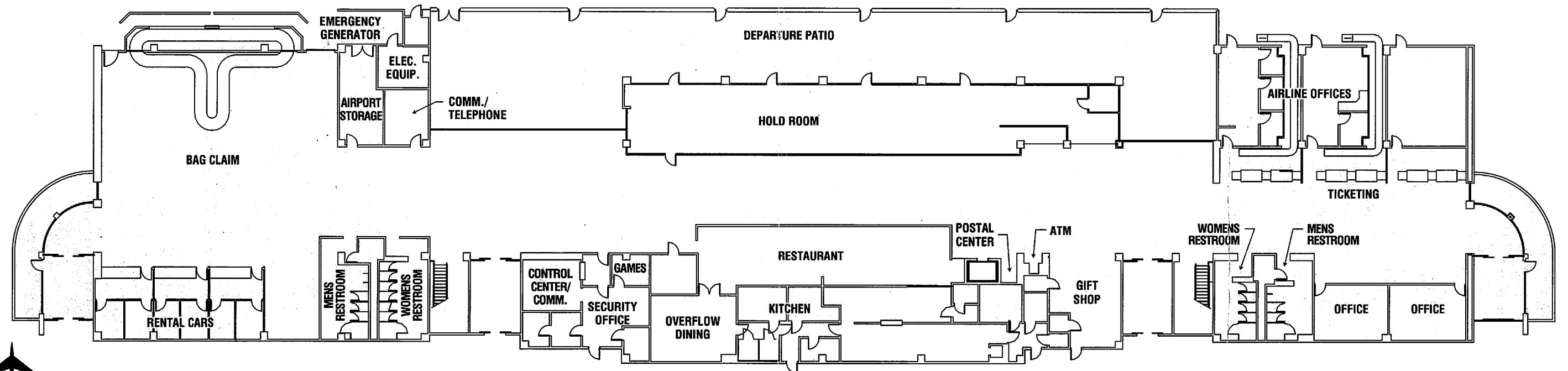
General aviation facilities include aircraft parking aprons, aircraft storage buildings and maintenance hangars, and fixed based operator (FBO) facilities. Bet-Ko-Air, Diamond Air Airline, Sun Western Flyers, Sun Care Air Ambulance, and Arcamex Avionics combine to provide a full-range of services to general aviation at the airport, which includes: aircraft fueling, aircraft maintenance, aircraft charter, flight training, pilot supplies, and air ambulance services. General aviation facilities are identified on **Exhibit 1D**.



SECOND FLOOR



FIRST FLOOR



NOT TO SCALE

TABLE 1D	
New Passenger Terminal Building Square Footage	
First Floor	Square Footage
Ticket Lobby	1,492
Airline Offices	3,611
Bag Claim	2,210
Bag Claim Lobby	2,783
Holdroom	2,354
Patio/Holdroom	5,851
Central Lobby	6,441
Rental Car Offices	1,206
Restaurant	3,445
Gift Shop	560
Postal Equipment/ATM	111
Game Room	142
Exhibits/Advertising	379
Security Office	525
Control Center	942
Restrooms and Mechanical	4,859
Travel Agent	734
Total First Floor	37,645
Second Floor	Square Footage
Public Lounge	1,901
Bar Lounge	1,085
YCAA Administrative Offices	3,282
Balcony	1,382
Restrooms/Mechanical	653
Total Second Floor	8,303
Total Terminal	45,948

General aviation facilities are concentrated in three separate areas on the airport: west of the passenger terminal building, at the intersection of Fortuna Avenue and 32nd Street, and west of Runway 3L-21R along Taxiways I1, I2, and I3. The general aviation area located west of the passenger terminal building includes an 18,100 square yard parking apron, 27 aircraft tiedown positions, and storage and maintenance

hangars. Sun Western Flyers, Sun Care Air Ambulance, and Arcamex Avionics are located in a single facility along the eastern edge of the apron providing 3,000 square feet of hangar space, 1,200 square feet of shop space, and 1,000 square feet of office space. Two 1,500 square-foot conventional hangars are located along the northeast portion of the apron and are used for individual aircraft storage.

In the general aviation area near the intersection of Fortuna Avenue and 32nd Street there is a five-unit "box" facility, and two, four-unit "box" hangars owned and operated by the YCAA. Each hangar is leased to individual aircraft owners by the YCAA.

General aviation facilities located west of Runway 3L-21R include conventional, shade, and T-hangar storage, aircraft tiedown, and an aircraft wash facility. The aircraft wash facility and Diamond Air Airlines are located adjacent to a 12,000 square yard parking apron along Taxiway I1. The aircraft wash facility was constructed in 1996. Diamond Air Airlines facilities include 1,600 square feet of hangar space and 700 square feet of office space. The Sun Western Flyers maintenance hangar, Bet-Ko-Air, and two twelve-unit shade hangars are located west of Taxiways I2 and I3 on a 82,300 square yard apron which provides approximately 100 aircraft tiedown positions and two helicopter parking positions. The Sun Western Flyers maintenance hangar is leased from the YCAA and provides approximately 8,000 square feet of hangar space and 2,000 square feet of office space. Bet-Ko-Air facilities include an 8,500 square-foot aircraft storage hangar located along the southwest portion of the apron and a separate facility located directly south of the Sun Western Flyers maintenance hangar providing 4,800 square feet of hangar space and 2,400 square feet of office space. The YCAA completed the acquisition of the J-Mar six-unit hangar facility in 1998.

General aviation parking is available in two separate areas and totals approximately 85 spaces. Approximately 25

spaces are located in the general aviation area west of the terminal building. An additional 60 spaces are located in the west general aviation area.

Table 1E summarizes general aviation facilities at Yuma International Airport.

Fuel Storage Facilities

All aircraft fuel storage facilities at the airport are privately-owned and operated. Bet-Ko-Air operates two 10,000 gallon tanks of 100 low lead (LL) Avgas and one 20,000 gallon Jet A underground fuel storage tanks. According to records maintained by the Arizona Department of Environmental Quality (ADEQ), the two 10,000 gallon 100 LL Avgas underground tanks were installed in 1988. The 20,000 gallon Jet A underground tank was installed in 1991. Sun Western Flyers operates two 12,000 gallon 100 LL and three 12,000 gallon Jet A underground storage tanks. According to records maintained by the ADEQ, the 100 LL Avgas tanks were installed in 1972 while the Jet A tanks were installed in 1982. Fuel is dispensed through mobile fuel delivery trucks.

Fuel storage facilities at the Boeing/Douglas Products Division (B/DPD) include: five Jet-A fuel storage tanks totaling 130,000 gallons, a 2,500 gallon unleaded fuel storage tank and 2,500 gallon diesel fuel storage tank. The five Jet-A fuel storage tanks are owned and operated by Bet-Ko-Air. Fuel is dispensed through mobile fuel delivery vehicles. Unleaded and diesel fuel is dispensed through stationary fuel

islands. The unleaded gasoline and diesel fuel systems are owned and operated by the B/DPD.

Other Facilities

The U.S. Customs Service is located adjacent to the terminal apron, west of

the existing YCAA administration building in a 715 square-foot office trailer leased from the YCAA. The U.S. Customs service is responsible for the inspection of all passengers and aircraft entering United States at the airport. Their services are available on a scheduled basis.

TABLE 1E
Summary of General Aviation Facilities

Shade and T-Hangar Positions	41
Shade and T-Hangar Area (s.f.) ¹	47,500
Conventional Aircraft Storage and Maintenance Hangar Area (s.f.)	28,879
Office and Shop Area (s.f.)	7,300
Aircraft Tiedown Positions	156
Total Apron Area (s.y.)	112,400
¹ Includes J-Mar Hangar facility and "box"hangars owned by the YCAA	

FAA navaid technical support is located in an FAA-owned 780 square-foot trailer located adjacent to the U.S. Customs Service facility. The FAA maintains a 220 square-foot maintenance building adjacent to their office space.

Boeing/Douglas Products Division leases approximately 47 acres from the YCAA for large aircraft testing and certification. The Boeing/Douglas Products Division lease area is located west of Runway 3L-21R. The apron, buildings, and connecting taxiway are owned and maintained by Boeing/Douglas Products Division. A five-year license (expiring on September 30, 2000) allows for operations on this taxiway.

(Note: Boeing / Douglas Products Division closed the Yuma test facility effective October 31, 1999.)

Utilities

Utilities that service Yuma International are supplied by the same municipal and public utilities that provide service to the City of Yuma. Electrical power service is provided by Arizona Public Service (APS). Southwest Gas Corporation supplies the airport with natural gas service. The City of Yuma provides water, sanitary sewer, and solid waste collection.

VICINITY AIRSPACE, AIR TRAFFIC CONTROL, AND AIRPORTS

AIRSPACE

The airspace that encompasses Yuma International is extremely complex and affected heavily by military activity in the region. Yuma International Airport is located within an area of controlled airspace, known as Class D airspace. As shown on **Exhibit 1F**, the Class D airspace extends outward from the center of the airport to a radius of 5.2 nautical miles, and stretches from the surface up to 2,700 feet MSL. When the Yuma ATCT is closed, this airspace reverts to Class E airspace (General Control).

The majority of the airfield itself lies within an area of special-use airspace designated as a Military Operations Area (MOA). This area, known as the Dome MOA, begins south of Runway 8-26 extending both west and south to the U.S.-Mexico border, and east to where it abuts a restricted airspace area R-2301W. Civilian operations within a MOA are not prohibited though civilian aircraft are cautioned to remain alert for military aircraft while operating in the MOA. Military operations in the Dome MOA are intermittent and these schedules may be obtained by NOTAM (Notice To Airman). Military operations within the Dome MOA are conducted at altitudes above 6,000 feet Mean Sea Level (MSL).

Restricted Area R-2301W begins approximately five miles east of the airport and covers the entire area from Interstate Highway 8 south to the U.S.-

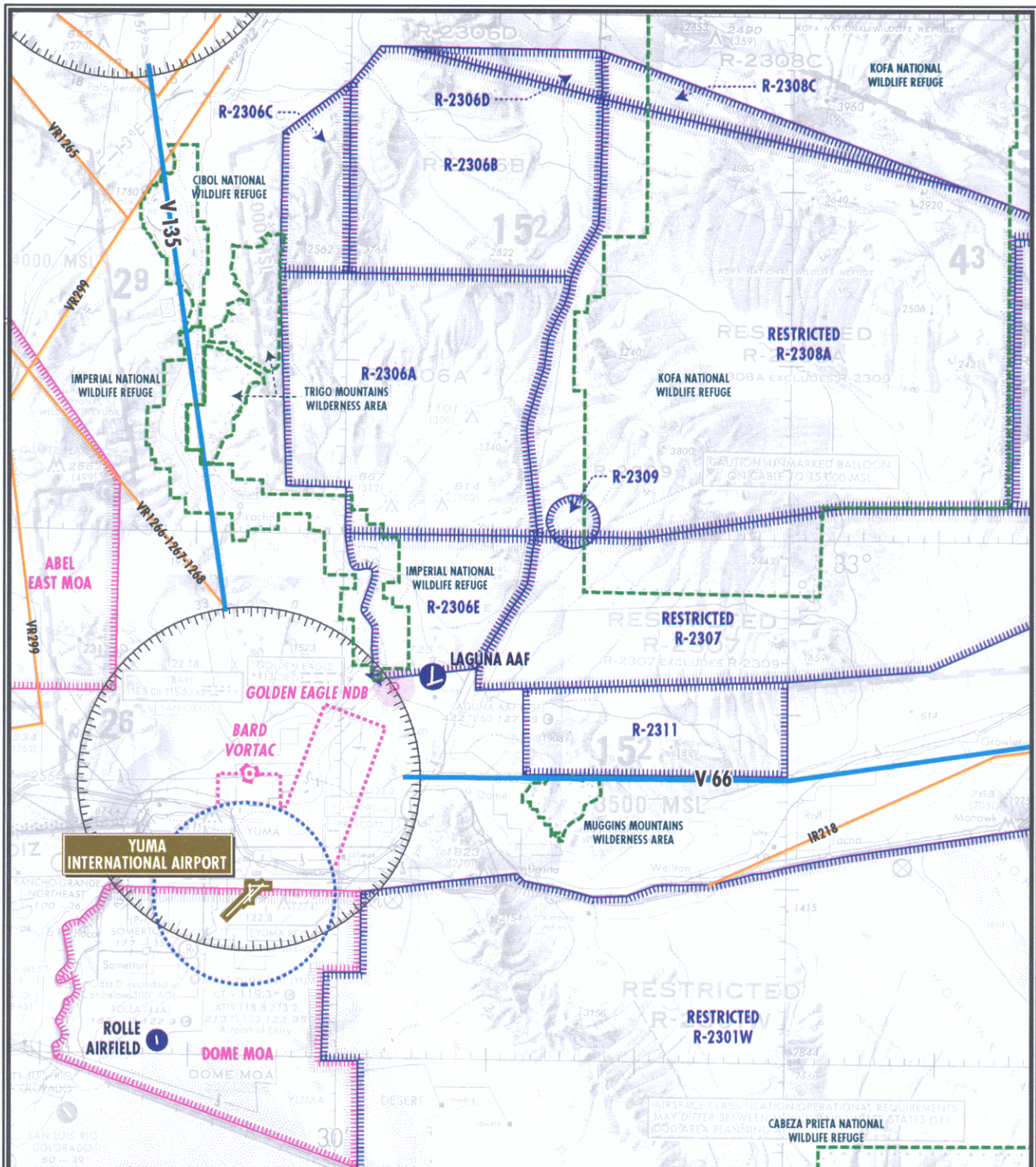
Mexico border. Operations within R-2301W are continuous and at altitudes from the surface up to Flight Level 800 (80,000 feet).

Located northeast of the airport are Restricted areas R-2306A, B, C, D, E; R-2307; R-2308 A, B, D; R-2309 and R2311. Military operations within all these areas are continuous and at varying altitudes. Restricted areas R-2306A, B, and E and R-2308B extend from the surface to 80,000 feet. R-2306C extends from the surface to 17,000 feet. R-2306D extends from the surface to FL 230 (23,000 feet). Military aircraft have no altitude restrictions within R-2307. R-2308A extends from 1,500 above the surface to 80,000 feet while R-2308C extends from 1,500 feet above the surface to Fl 230. R-2309 extends from the surface to 15,000 feet to protect a tethered balloon. R-2311 extends from the surface to 3,500 feet MSL.

Northwest of the airport is the Abel East MOA which operates intermittently at altitudes between 5,000 feet MSL up to, but not including 13,000 feet MSL.

The Imperial National and Cibola Wildlife Refuges, as well as the Muggins and Trigo Mountains Wildlife Areas are located within the vicinity of the airport. While aircraft operations are not restricted over these areas, aircraft are requested to maintain a minimum altitude of 2,000 feet above the surface.

For aircraft enroute or departing the area using VOR navigational facilities, a system of federal airways, referred to as Victor Airways, has been established by the FAA. Victor Airways are corridors of airspace eight miles wide that extend



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upward from 1,200 feet MSL to 18,000 feet MSL and extend between VOR navigational facilities. All Victor Airways in the area emanate from the Bard VORTAC and are identified on Exhibit 1F.

AIR TRAFFIC CONTROL

The complexity of the airspace surrounding Yuma International Airport produces several levels of air traffic control. Aircraft operating within the Class D airspace surrounding the airport are controlled by airport traffic control personnel located on the airport. The airport traffic control tower is operated by the MCAS and operates from 7:00 a.m. to midnight daily. Aircraft outside Class D airspace are controlled by Yuma Approach Control, also operated by the MCAS.

AREA AIRPORTS

Airports in the vicinity of Yuma International Airport are shown on Exhibit 1F. Normally, a review of public-use airports within 30 nautical (air) miles of an airport is completed for an airport master plan study to identify and distinguish the type of air service provided by competing airports. A review of the area around Yuma International Airport reveals that there are only two other public-use airports within 30 nautical miles of the airport: Rolle Airfield and Laguna Army Airfield (AAF). Neither Rolle Airfield or Laguna AAF provide services to the public such as fuel, aircraft tiedown and storage, or maintenance. Each airfield is used as a reliever for general aviation and military

training operations from Yuma International Airport/MCAS Yuma. Rolle Airfield is owned by Yuma County and operated by the YCAA.

CLIMATE

The climate of Yuma is typical for the low desert region of the southwestern part of Arizona. According to National Oceanic and Atmospheric Administration records (NOAA), annual precipitation averages 3.17 inches, with most of this falling in the winter months of December and January, and in August and September, the months of heaviest local thunderstorm activity. The normal daily mean temperatures for Yuma ranges from an annual high of 93.7 degrees (F) in July to an annual low of 56.4 degrees (F) in December. The hottest month is July with a daily mean maximum temperature of 106.6 degrees (F). On average, there are 242 clear days, 71 partly cloudy, and 52 cloudy days each year. Wind speeds are normally light, averaging 7.8 miles per hour.

SOCIOECONOMIC CHARACTERISTICS

A variety of historical socioeconomic data, related to the regional area, has been collected for use in various elements of this master plan. This information is essential in determining aviation service level requirements, as well as forecasting future activity at the airport. Aviation forecasts are normally directly related to the population base, economic strength of the region, and the ability of the region to sustain a strong

economic base over an extended period of time.

POPULATION

The size and structure of the local communities and the service area that the airport supports are important factors to consider in the planning of airport facilities. These elements provide an understanding of the economic base necessary to determine future airport requirements.

Though the average annual population growth in the City of Yuma lags slightly behind both the county and state, it is still reflective of the State of Arizona as a whole. The period from 1985 to 1995 saw the city population grow at an annual rate of 2.6 percent, while the county and state grew at 3.5 percent and 2.9 percent, respectively. Increases in

population have resulted mainly from immigration from other states and Mexico. Approximately two-thirds of state residents have moved to Arizona from elsewhere. Presently the City of Yuma accounts for roughly 50 percent of the county population.

Yuma County was divided in 1983, with La Paz County being established as a separate political entity within the state. La Paz County encompasses what was mostly rural sections of northern Yuma County. Comparison of historical county population statistics and other socioeconomic factors prior to that time would be inconsistent with recent data. As such, only demographic information for Yuma County after county division will be used. Historical population data and projected growth estimates for Yuma County and the City of Yuma are summarized in **Table 1F**.

TABLE 1F
Historical Population
City of Yuma, Yuma County, State of Arizona

Year	City of Yuma	Percent Change	Yuma County	Percent Change	Arizona	Percent Change
1985	46,455	N/A	86,200	N/A	3,211,300	N/A
1990	54,923	3.4%	106,875	4.4%	3,665,228	2.7%
1995	60,457	1.9%	121,097	2.5%	4,228,900	2.9%

Source: Arizona Department of Economic Security, Research Administration, Population Statistics Unit

EMPLOYMENT

Table 1G summarizes historical Yuma County population by sector for the period 1985 to 1997. As shown in the table, all employment sectors, with the exception of mining and quarrying, have experienced strong growth since 1985. As noted in the introduction of this

chapter, Yuma is predominately an agricultural region, with employment in this sector more than doubling between 1985 and 1997. The services sector and transportation and public utilities sectors have also doubled during this period, while retail/wholesale trade has seen an overall growth of 50 percent, and government 36 percent growth.

TABLE 1G
Historical Employment by Sector (1985-1997)
Yuma County

	1985	1990	1995	1997	Avg. Annual Growth Rate
Agriculture, Farming, and Ranching	5,125	9,050	11,400	11,875	7.2 %
Manufacturing	1,550	2,100	1,400	1,600	.26 %
Mining and Quarrying	50	50	0	0	N/A
Construction	1,625	1,475	1,700	2,000	1.7 %
Transportation and Public Utilities	875	1,125	1,700	1,800	6.1 %
Retail/Wholesale Trade	6,975	8,325	12,100	11,700	4.4 %
Finance, Insurance, and Real Estate	900	1,050	1,200	1,100	1.6 %
Services and Miscellaneous	4,475	6,450	8,500	9,000	5.9 %
Government	6,300	7,900	9,200	9,800	3.7 %
Totals	27,875	37,525	47,200	48,875	4.7 %

Source: Arizona Department of Economic Security, Research Administration

Currently, the four largest employment sectors are Agriculture (with 24 percent of the work force), retail/wholesale trade (at 24 percent), government (at 20 percent), and services (at 18 percent).

INCOME

Table 1H compares Per Capita Personal Income (PCPI) for Yuma County, the

State of Arizona, and the United States between 1984 and 1994. In 1994, Yuma County had a PCPI of \$13,764, which ranked 11th in the state and was 72 percent of the state average and 63 percent of the national average. The average annual growth rates for Yuma County, the State of Arizona, and the United States PCPI are summarized in **Table 1G**.

TABLE 1H**Per Capita Personal Income (PCPI)****Yuma County, State of Arizona, United States**

Year	1984	1990	1994	Average Annual Growth Rate
Yuma County	\$10,631	\$12,096	\$13,764	3.4 %
State of Arizona	13,220	16,265	19,147	4.5 %
United States	14,155	18,667	21,696	5.0 %

Source: U.S. Department of Commerce, Regional Economic Information System, Bureau of Economic Analysis

SUMMARY

The information discussed on the previous pages provides a foundation upon which the remaining elements of the planning process will be constructed.

Information on current airport facilities and utilization will serve as a basis, with additional analysis and data collection, for the development of forecasts of activity, and facility requirement determinations.